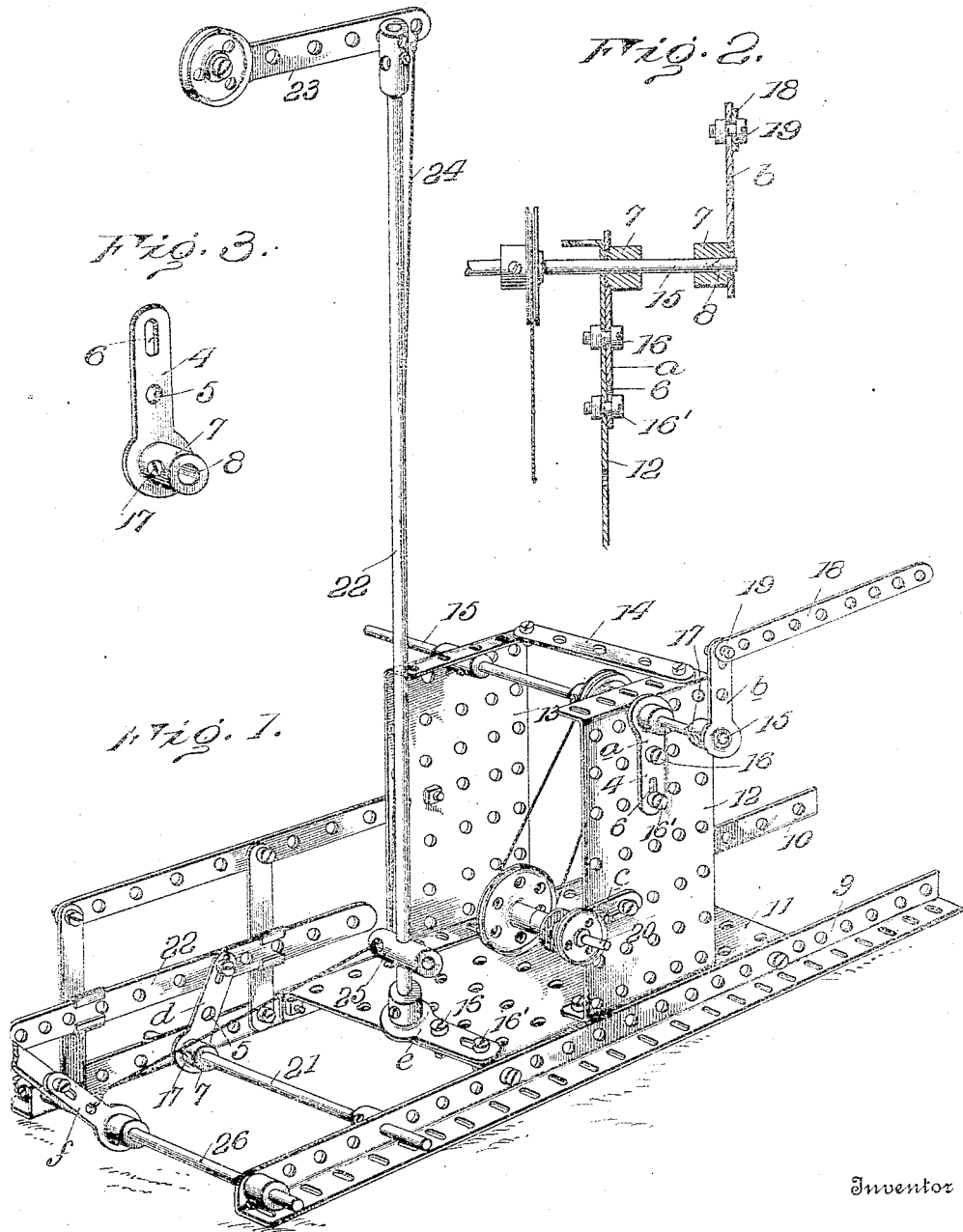


F. HORNBY.  
TOY OR WORKING MODEL.  
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TOY OR WORKING MODEL.

1,161,131.

Specification of Letters Patent.

Patented Nov. 23, 1915.

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*To all whom it may concern:*

Be it known that I, FRANK HORNBY, a subject of the King of Great Britain, and resident of Liverpool, England, have invented a new and useful Improvement in Toys or Working Models, which invention is fully set forth in the following specification.

The present invention relates to an improved mechanical element and the combination of such element with other elements or parts, to be used in the construction of toys or working models of machinery, structures, or similar mechanisms.

In the building of models from perforated elements embodying also the use of gear wheels, pulleys, shafting, and like machine parts and in which various members of the machine are adapted to be assembled together and mounted in or on the perforated elements, it has been found desirable, in order to simplify and increase the rigidity of the structures, eliminate wobbling of shafts, improve and simplify the connections between moving parts and increase the use of rods and shafting, to provide a flat elongated strip which is provided at one end with a laterally-extending perforated lug or projection, with a perforation at its other end and with an intermediate perforation. The three perforations are so spaced as to register with perforations in the elements used in the construction of models, toys and the like. By the use of such element for the purposes above indicated, among others, the working models or toys are made more nearly mechanically correct and are therefore rendered more attractive and of greater educational value.

The invention will be better understood by reference to the accompanying drawings, illustrating one embodiment of the inventive idea as applied to the improved element and showing the same in various combinations with perforated elements, rods, shafting and the like, and wherein—

Figure 1 is a perspective view of a working model showing a few of the many practical uses to which the improved element may be put in combination with other parts of said working model; Fig. 2 is a sectional view of part of said model; Fig. 3 is a perspective view of one form of the improved element.

Referring to the drawings wherein like

reference letters and numerals designate like parts, 1 indicates a flat elongated strip, preferably of sheet metal. In the embodiment herein shown, said strip is perforated at 5 and is also provided at one end with a perforation 6, preferably elongated. At its other end said strip is provided with a laterally extending lug or projection 7 which is provided with a perforation 8. This lug may be formed integrally with the sheet metal strip, but preferably a separate brass lug is employed, which is secured in any desired manner in a perforation in said strip. The size of the perforation 8 is the same as that of the standard size of rods, axles, shafting and the like which are employed in the construction of working models according to the present system, and in combination with which said element is employed. The perforations 5, 6 and 8 are so spaced as to register with the perforations in the other elements employed in the building of models, toys and the like.

In Fig. 1 there is shown, by way of illustration, a working model which illustrates some of the many practical uses to which the improved element may be put in combination with other elements used in the construction of the toys or models. In said figure, 9 and 10 indicate right-angle perforated strips, between which is secured a perforated flanged plate 11, such as described and claimed in my U. S. Patent No. 1,079,215. Mounted on said plate are two other flanged perforated plates 12 and 13, to the upper flanges of which is secured a flat perforated strip 14. A shaft 15 projects through one of the perforations in each of said plates 12 and 13, and at *a* the improved element is shown as a bearing for one end of said shaft 15, the perforation 8 registering with the opening in plate 12 through which the shaft 15 projects. It will be observed that this element is secured to the plate 12 by suitable retaining means which pass through perforation 5 and slot 6 and that these openings are so spaced as to register with the uniform spacing of the perforations in the plates and strips used in the construction of working models according to the present system. As here shown, bolts 16, 16' are the form of retaining means employed.

The improved element 1 is readily secured on the perforated plates in intimate engagement therewith and affords an extended

bearing for the shaft 15, so that the latter will rotate without wobbling and with the minimum of friction, the operation of the device being thus greatly improved and its construction being rendered more nearly mechanically correct. The element is shown in another combination at *b*, where it is securely mounted on the end of shaft 15 by a retaining means 17, here shown in the form of a pinching screw which engages in a screw-threaded opening in the lug 7. The free end of said element is connected to a flat perforated strip 18 by means of a suitable connecting member 19 which passes through one of the perforations in said strip and through the elongated slot 6 in said element. The improved device is here used as a crank to transmit motion from the shaft 15 to the strip 18.

At *c* the improved device constitutes an extended bearing for a shaft 20, said shaft being mounted outside of the edge of the perforated plate 12, to which the improved element is secured as above set forth. Such a bearing is frequently desired in the construction of working models, and the present improved device used in combination with the perforated plates responds to all of the requirements in a conspicuous manner, affording a firm and secure bearing for such shaft, so that the latter may rotate smoothly and without wobbling. At *d* said element is used in combination with a shaft 21 and a perforated strip 22, said element connecting said shaft and strip and operating as a rocking lever. The use of this element largely increases the availability of rods and shafting in the building of working models according to the present system, whereby mechanisms and structures may be more faithfully copied with said working models and the operation of the same more correctly reproduced.

At *e* the improved element is shown secured to the perforated flanged plate 11 in a manner heretofore described, and said element is here used as a foot-step bearing for an upright rod 22 which is here shown as a support for a semaphore arm 23, which arm is operated through the medium of a cord 24 passing through an opening in a guide 25 secured to said rod 22.

At *f* the improved device is shown as an operating lever mounted upon a shaft 26 and the cord 24 is connected to said operating lever. Such a construction for operating a semaphore arm or the like is simple, mechanically correct, and operable with the minimum of friction and the maximum of efficiency.

In Fig. 11 of my said Patent No. 1,079,245, there is shown the manner in which I have heretofore mounted and operated a semaphore arm. As will be observed, in the patent the upright, on which the semaphore arm

was mounted, was made up of two flat perforated strips which were secured together at their upper ends and at their lower ends were secured, one to each side of, a flanged plate. Further, the operating lever, which was in the form of a flat strip, was pivoted to a second perforated flanged plate which was mounted on the first-mentioned flanged plate. By the use of the said element as a foot-step bearing for the rod 22, the form of mounting for the semaphore arm has been improved, simplified and rendered more attractive, and by using the said element as an operating lever mounted on the shaft 26 the device sought to be copied has been more faithfully reproduced, said model therefore having an increased educational entertaining value.

It will be appreciated that the improved element, in whatever combination it is used, may be readily put in place, by reason of the relation which perforations 5, 6 and 8 bear to the spacing of the holes in the perforated plates and strips used in the construction of working models, as well as the fact that the size of the perforation 8 is the same as that of the standard rods, axles, shafting and the like which I employ; and that the use of said element in the working models endows them with increased rigidity and enables me to employ rods, shafting, axles and the like in places where heretofore it has been necessary to employ other elements. It will further be appreciated that by the use of said element, shafting may be mounted at any desired point within or without the framework proper of the model, and that the shafting so mounted is supported so as to rotate smoothly and without wobbling. The use of the improved element, in the relations described, among many others, increases the simplicity and attractiveness of the structures and mechanisms, improves the operation of moving parts, and makes each model a more faithful mechanical reproduction of the structure which it is sought to reproduce.

While for the purpose of illustration, one form of the improved device is herein illustrated in various combinations, it is to be understood that the invention is not limited to the particular embodiment shown, but that changes may be made without departing from the spirit of the invention which is defined in the claims which follow.

What is claimed is:—

1. The combination, in a working model, toy or the like, of a flat elongated element provided at one end with a laterally-extending perforated lug, at its other end with a second perforation and with a third intermediate perforation, a rod, shaft or the like adapted to pass through the perforation in said lug, and a perforated member to which said element is adapted to be secured; and means passing through the perforations in

said member and element and securing them together.

2. The combination, in a working model, toy or the like, of a flat elongated element provided at one end with a laterally-extending perforated lug, at its other end with a second perforation and with a third intermediate perforation, a rod, shaft or the like adapted to pass through the perforation in said lug, a perforated plate on which said element is adapted to be mounted, and means passing through the perforations in said plate and element and securing them together.

3. The combination, in a working model, toy or the like, of a flat elongated element provided at one end with a laterally-extending perforated lug, at its other end with a second perforation and with a third intermediate perforation, a rod, shaft or the like adapted to pass through the perforation in said lug, and a perforated strip to which said element is adapted to be secured, and means passing through the perforations in said strip and element and securing them together, the perforations in said strip and element being spaced to register.

4. The combination, in a working model, toy or the like, of a flat elongated element provided at one end with a laterally-extending perforated lug, at its other end with a second perforation and with a third intermediate perforation, a rod, shaft or the like adapted to pass through the perforation in said lug, a perforated plate on which said element is adapted to be mounted, and means passing through the perforations in said plate and element and securing them

together, the three perforations in said plate and element being spaced to register.

5. The combination, in a working model, toy or the like, of a flat elongated element provided at one end with a laterally-extending perforated lug, a rod, shaft or the like adapted to pass through the perforation in said lug, a second perforated element to which said flat element is adapted to be secured, and securing means passing through the perforations in said elements which are spaced so as to register with each other.

6. A sheet metal elongated element for use in the construction of working models, toys or the like comprising a flat strip having perforations at each end and at about its center, and a laterally projecting lug at one end of said strip through which the perforation at the said end extends with uniform diameter throughout.

7. A sheet metal elongated element for use in the construction of working models, toys or the like comprising a flat strip having perforations at each end and at about its center, a laterally projecting perforated lug associated with the perforation at one end of said strip, and retaining means carried by said lug and adapted to engage a rod, shaft or the like passing through the perforation in said lug, the perforation at the other end of said strip being elongated.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

FRANK HORNBY.

Witnesses:

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RALPH L. SCOTT.